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(54) **Filtering device for a citrus juice extraction machine and configuration of a perforating filtering tube for the extraction of fruit juices**

(57) Improvement to a filtering device for a citrus juice extraction machine consisting of a perforating tube (1) having multiple transverse slits (2) of increasing diameter from inside to outside, concentric to the peeler (3), and the tubular juice collector (5), that has a window opening (12) and a threaded cover (6), which centers the tube (1), being built-in a tubular extension (7) on which slides a rod (8) connected to the piston (9) pushed by the spring (10) being that the cutting extremity of the piston extends outward of the tube (1); a chamber (11) collects the juice filtered through the slits (2).

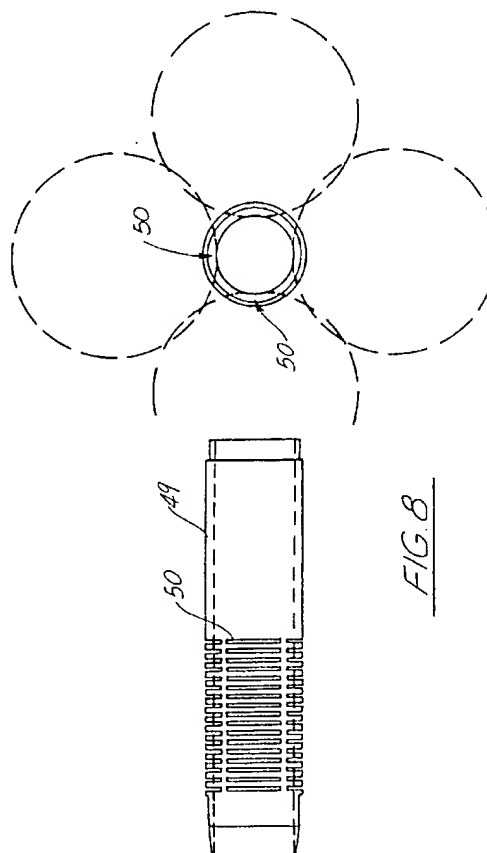


FIG. 8

Description

The patent referred to here as "IMPROVEMENT TO A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", as the nomenclature applies, improvements which consist of a singular mechanical device of automatic functioning, that by incorporation to the citrus juice extraction machine, increases substantially its productivity and the quality of the obtained product (juice), be it that at every cycle of operation the system passes through a total cleaning and the refuse from the fruit are expelled into a single reservoir, which facilitates the sanitation of the equipment and avoids the proliferation of bacteria.

For such, one of the details of the device refers to a perforating tube (described in process "PI 9502244-9" of June 19, 1995), which was incorporated into a high efficiency filtering system, since it is self cleaning.

It is worth noting that there does not exist any electromechanical device for the driving of the said assembly, which consists basically of the perforating filter and a piston concentric to same, which promotes the internal scraping of the filter in order to clean it.

Such device is totally unknown by the state of the technology and its installation guarantees a relevant increase in the productivity of the assembly.

To better elucidate the model, references will be made to the following included drawings, where:

FIGURE 1 shows a side view of the machine, displaying details of the device.

FIGURE 2 illustrates a plan view of the device installed on the machine.

FIGURE 3 illustrates the perforating filter.

"IMPROVEMENT TO A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", constitute by an automatic system, composed by an extended perforating tube (1) having multiple transverse slits (2) of increasing diameter from inside to outside, being said tube (1) concentrically affixed to the fixed peeler (3), mounted with bolts to the side wall of the machine (4) jointly with the flange of the tubular juice collector (5), which projects itself outwardly from the machine.

Said juice collector (5) has a threaded cover (6), concentrically to which engages the perforating tube (1), being on said cover (6) built-in a tubular extension (7) on which slides a rod (8) connected to the piston (9) which works inside the tube (1), being that the cutting extremity projects itself out of this tube in order to expel the refuse for the pressing of the fruit, since during the pressing the piston is impelled inwardly to the tube (1) and in this manner offers a counter pressure on the flow of extraction, due to the action of a helical compression spring (10).

The juice is filtered by the slits (2) which by its configuration is self cleaning, passing through a chamber (11) formed by the juice collector (5) and the peeler (3). The juice is totally filtered, then exiting through a window (12) on the juice collector, directly to the interior of a dedi-

icated reservoir.

The refuse materials are collected by a central reservoir; being observable that this system, allied to the use on stainless steel materials, guarantees the maintenance of the organoleptic characteristics of the extracted juice.

SUMMARY

Patent of a model of utility "IMPROVEMENT TO A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", composed of improvements introduced to the filtering system of the machine of the claimant consisting of a perforating tube (1) having multiple transverse slits (2) of increasing diameter from inside to outside, concentric to the peeler (3), and the tubular juice collector (5), that has a window opening (12) and a threaded cover (6), which centers the tube (1), being built-in a tubular extension (7) on which slides a rod (8) connected to the piston (9) pushed by the spring (10) being that the cutting extremity of the piston extends outward of the tube (1); a chamber (11) collects the juice filtered through the slits (2).

A descriptive report of a patent invention of:

"A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE".

The patent referred to here as, "A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", as the title implies, improvements to the object described in process "PI 9502244-9" of June 19, 1995, of the same claimant, improvements which consist of singular mechanical device that functions automatically, that once incorporated into the machine, increases substantially its productivity and the quality of the obtained product (juice), be it that at every cycle of operation the systems passes through a total cleaning and the refuse from the fruit are expelled into a single reservoir, which facilitates the sanitation of the equipment and avoids proliferation of bacteria.

For such, one of the details of the device refers to a perforating tube (already described in another descriptive report), which was incorporated into high efficiency filtering system, since it is self cleaning.

It is worth noting that there does not exist any electromechanical device for the driving of the said assembly, which consists basically of the perforating filter and a piston concentric to same, which promotes the internal scraping of the filtering in order to clean it.

Such device is totally unknown by the state of the technology and its installation guarantees a relevant increase in the productivity of the assembly.

To better elucidate the model, references will be made to the following included drawings, where:

FIGURE 4 illustrates the top view detailing the device in question together with the cutting, pressing and juice extraction mechanism.

FIGURE 5 illustrates a cross-sectional side view and top view of the juice collector.

FIGURE 6 illustrates on a larger scale the support of the perforating filter.

FIGURE 7 illustrates the perforating tube's piston.

FIGURE 8 illustrates the cross section of the perforating filtering tube.

"A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", composed by two rods (41) passing through the machine's structure (42), and the sliding mobile peeler support (43). Said rods contain pins (44) which condition their return concurrently with the support (43) after the pressing of the fruit.

A base (45) is affixed to the two rods (41) in a manner such that the configuration facilitates the disassembly for cleaning purposes; on this base there is inserted a bolt (46) which mounts the extension (47) to the piston (48) (which need not have a same diameter relief at the center) which works concentric to the perforating tube (49) which in turn is concentric to the fixed peeler, mounted on the machine.

The piston (48) contains a cutting edge which projects itself out of the tube (49) at the end of the opening cycle of the peelers, so that it totally cleans the interior of this tube which contains a plurality transverse slits (50) which have increasing diameters from inside to outside, in a manner to facilitate the self cleaning.

The tube (49) is mounted to a round base (51) threaded to the tubular juice collector (52) which has a flange on which the static peeler is bolted to. Said collector and the peeler form a chamber (53) which collects the juice extracted from the fruit and filtered by the slits (50).

On the posterior position (outside of the machine) the collector (52) has a transverse slit (54) through which the totally filtered juice exits. The refuse materials (seed, core, etc.) pushed by the piston (48) fall inside the machine into a dedicated container.

It is worth noting that the constructive characteristics, allied to the utilization of stainless steel materials do not offer any alterations to the organoleptic characteristics of the fruit juice.

SUMMARY

Patent of invention "A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", developed for an equipment of the same claimant, being that its improvements are composed of two rods (41) passing through the machine's structure (42), and the sliding mobile peeler support (43) having pins (44) which condition the return of these rods to the support (43) being these rods fixed to a base (45) to which there is inserted a bolt (46) fixing the extension (47) to the piston (48) which contains a cutting edge and is concentric to the perforating tube (49) having multiple transverse slits (50) which is mounted to a round base (51) threaded to the tubular juice collector (52) which has a flange on which the static peeler is bolted on to so as to form the chamber (53) which collects the juice, which in turn exits

through slit (54).

A descriptive report of a patent of and industrial model:

"CONFIGURATION OF A PERFORATING FILTERING TUBE FOR THE EXTRACTION OF FRUIT JUICE".

The patent referred to here as "CONFIGURATION OF A PERFORATING FILTERING TUBE FOR THE EXTRACTION OF FRUIT JUICE", fabricated in stainless steel material or the like, an accessory utilized on the equipment described in process "PI 9502244-9" of June 19, 1995, of the same claimant, which is designed for cutting and perforating of fruit and filtering of the juice extracted, such as: lemon, orange, tangerine, pokan, etc., for the extraction of their juice, with greater quality, practicality and hygiene, thanks to the configuration of the artifact.

The object consists of a tubular part having multiple symmetrical slits, trochoidal and parallel to each other, through which the extracted fruit juice exits, being said part installed on the pressing assembly of the machine.

Said object makes a central cut on the fruit through which the juice exits to be filtered by the aforementioned self cleaning slits, thanks to their configuration.

It is worth noting that the object in question presents singular details in comparison to the state of the technology, encompassing therefore the conditions to achieve the privilege sought.

To better comprehend the model, references will be made to the following included drawings, where:

FIGURE 9 shows the tube in a cross-sectional view and a side view.

FIGURE 10 shows the tube perspective.

"CONFIGURATION OF A PERFORATING FILTERING TUBE FOR THE EXTRACTION OF FRUIT JUICE", composed of a body (61) of stainless steel material or other materials resistant to oxidation and adapted to this purpose, having a circular shape.

Its extremity (62) is sharpened in order to perforate the fruit, followed by a straight portion (63). The body (61) has a plurality of transverse slits (64), configured strategically through the machining by a circular mill, forming an external diameter (65) which is larger than the internal diameter (66), which in turn impedes the retention of filtered residues.

According to its broadest aspect the invention relates to a filtering device in particular for a citrus juice extraction machine, having a perforating tube (1) and a tubular juice collector (5), and

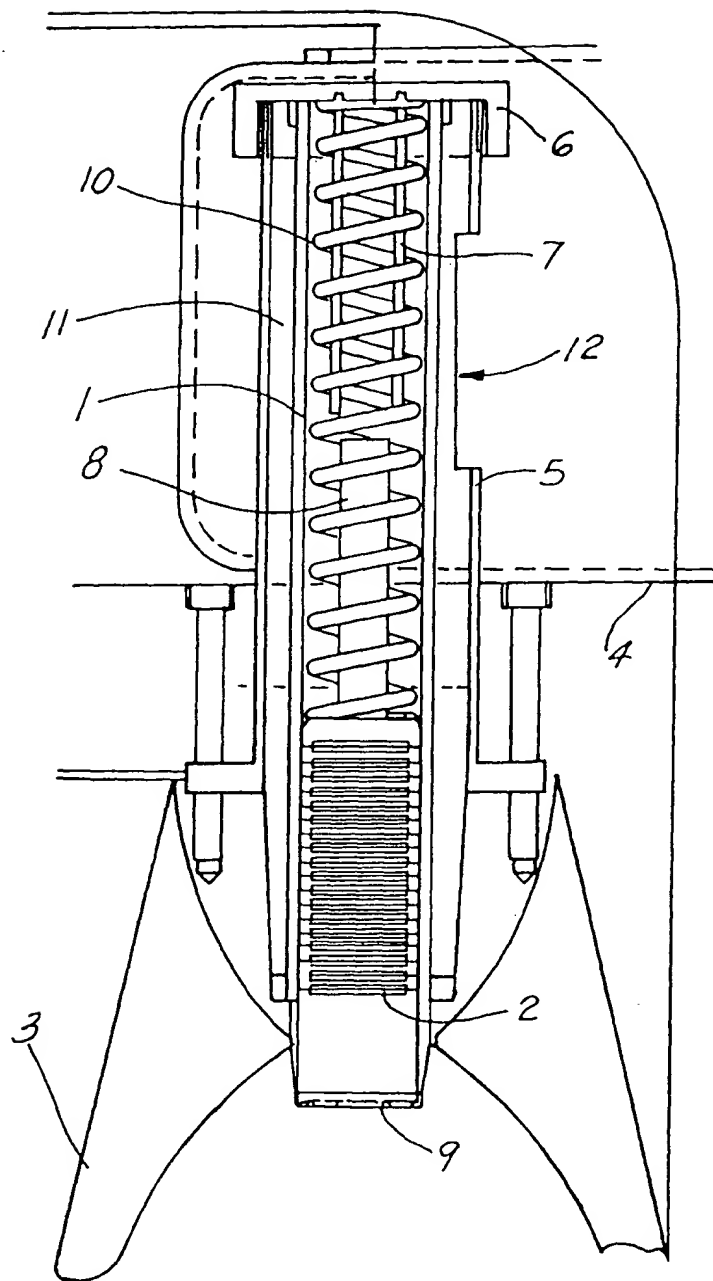
a chamber (11) collects the juice filtered through the slits(2).

Claims

1. "IMPROVEMENT TO A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", characterized by a perforating tube (1) having multiple

transverse slits (2) of increasing diameter from inside to outside, concentric to the peeler (3), and the tubular juice collector (5), that has a window opening (12) and a threaded cover (6), which centers the tube (1), being built-in a tubular extension (7) on which slides a rod (8) connected to the piston (9) pushed by the spring (10) being that the cutting extremity of the piston extends outward of the tube (1); a chamber (11) collects the juice filtered through the slits (2).

2. "A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", characterized by the fact that two rods (41) passing through the machine's structure (42), and the sliding mobile peeler support (43) having pins (44) which in turn are fixed to a base (45) to which there is inserted a bolt (46) fixing the extension (47) to the piston (48) which contains a cutting edge and is concentric to the perforating tube (49) having multiple transverse slits (50) which is mounted to a round base (51) threaded to the tubular juice collector (52) which has a flange on which the static peeler is bolted on to so as to form the chamber (53) which collects the juice, which in turn exits through slit (54).
3. "A FILTERING DEVICE FOR A CITRUS JUICE EXTRACTION MACHINE", in accord with claim 2, characterized by the fact that the cutting edge of the piston (48) protrudes out of the tube (49) on it return course, being slits (50) of this tube of an increasing diameter from inside to outside of the tube.
4. "CONFIGURATION OF A PERFORATING FILTERING TUBE FOR THE EXTRACTION OF FRUIT JUICE", characterized by the fact its shapes and other configuration details, are intrinsically and substantially in accord with FIGURES 9 and 10 of the included drawings.
5. "A FILTERING DEVICE IN PARTICULAR FOR A CITRUS JUICE EXTRACTION MACHINE", having a perforating tube (1) and a tubular juice collector (5), and
a chamber (11) collects the juice filtered through the slits (2).



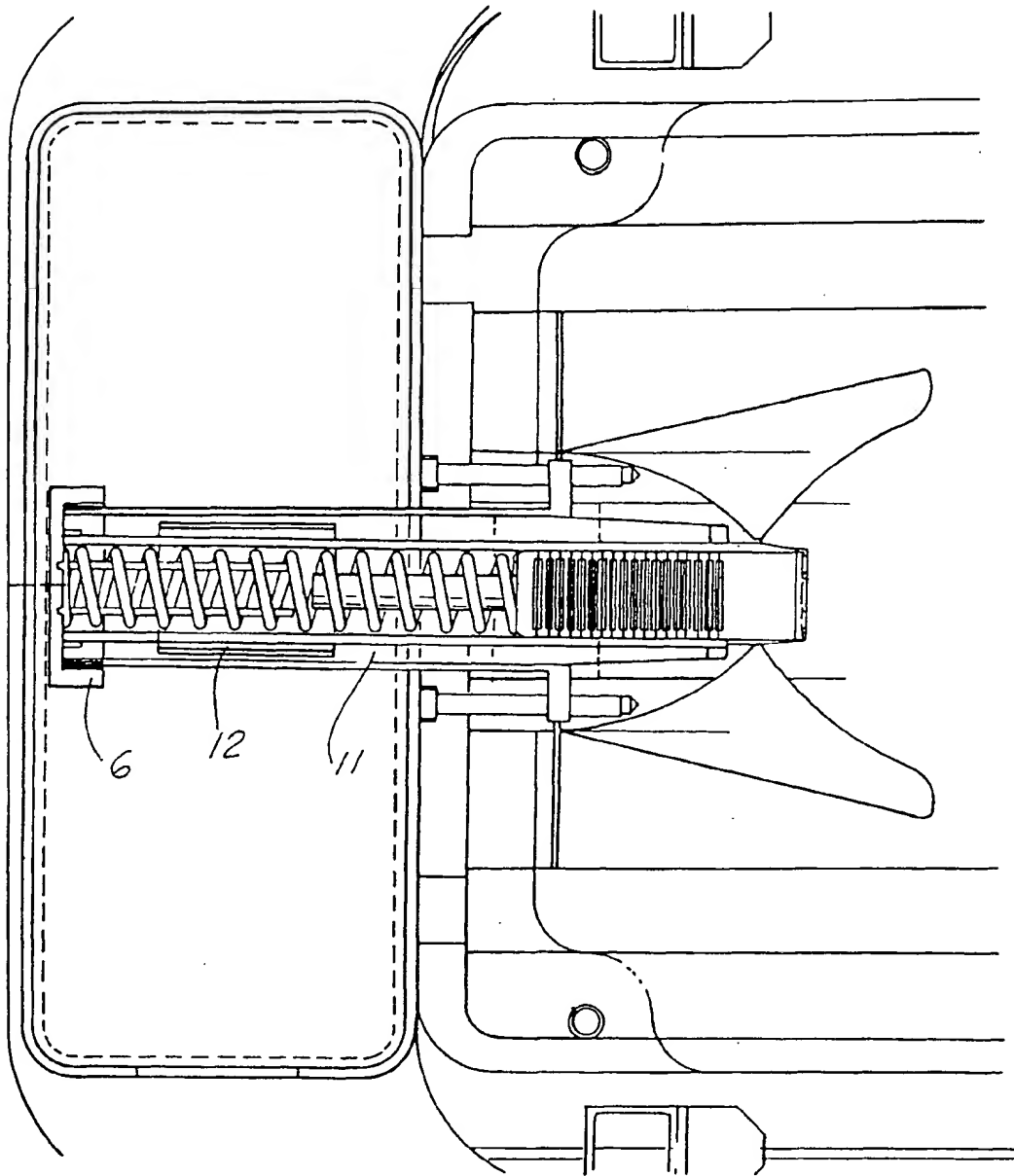


FIG. 2

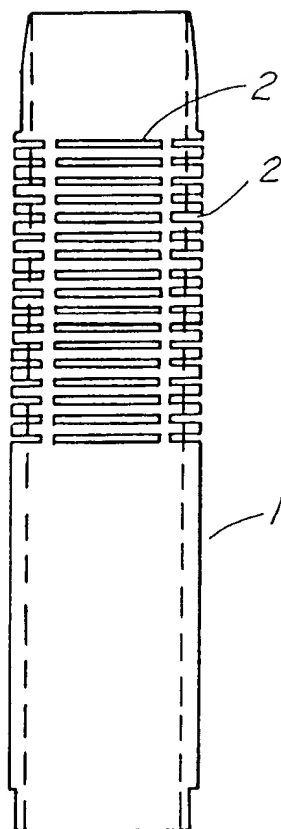


FIG. 3

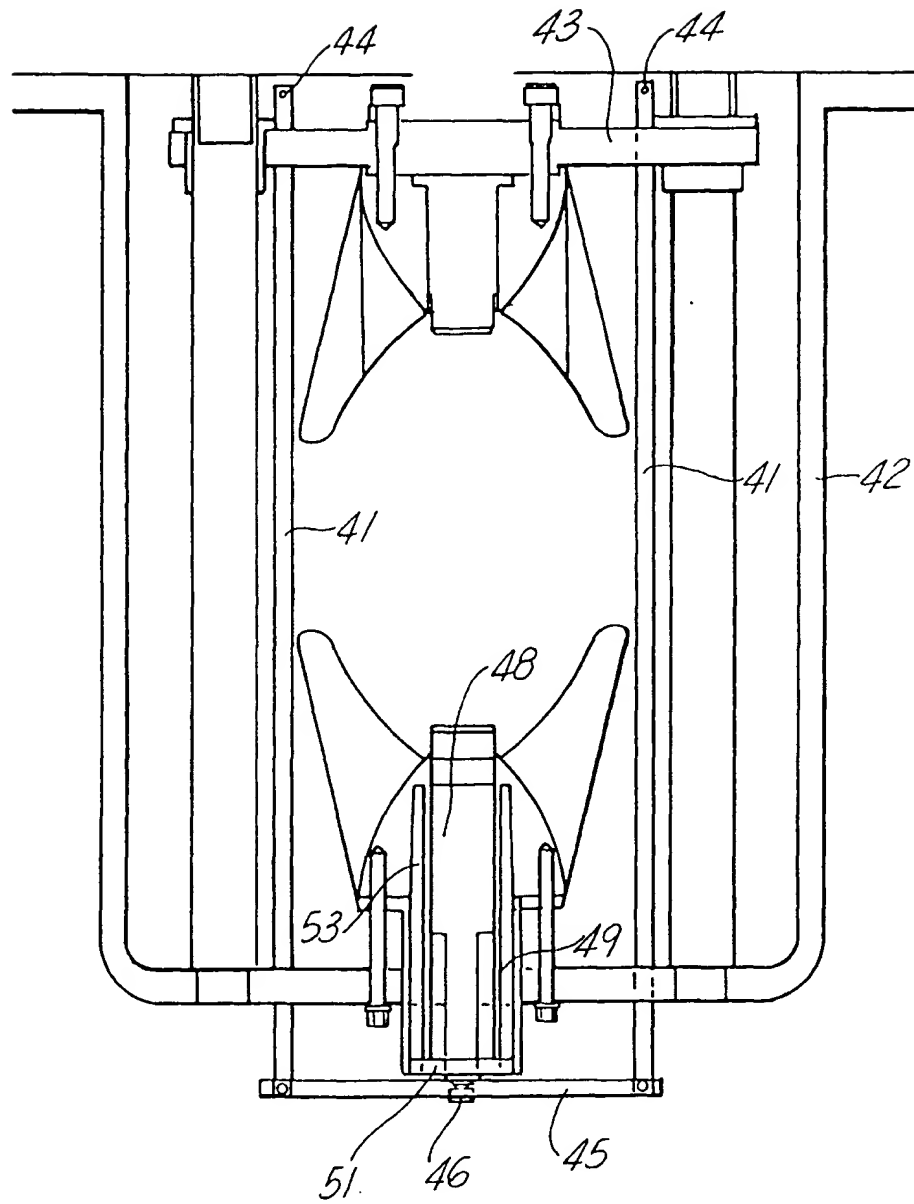


FIG. 4

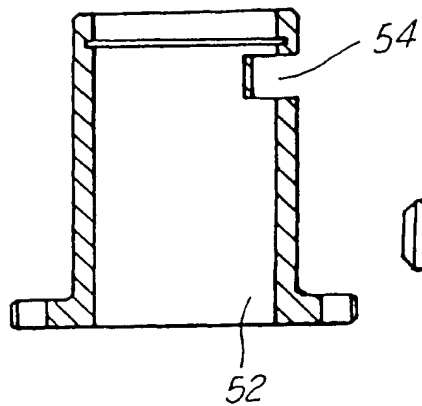


FIG. 5

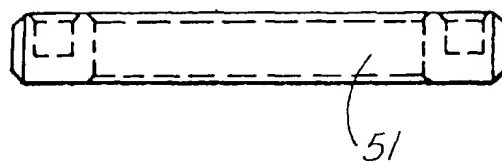
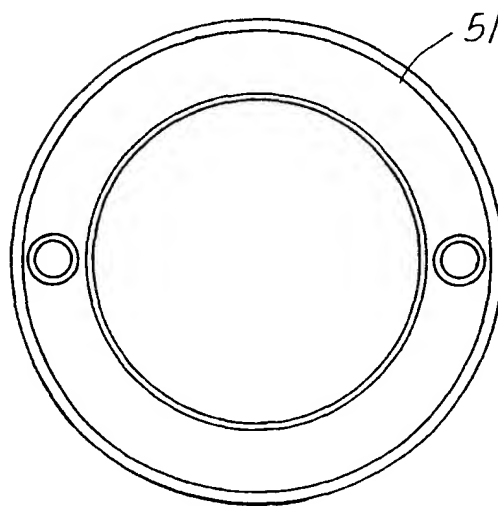
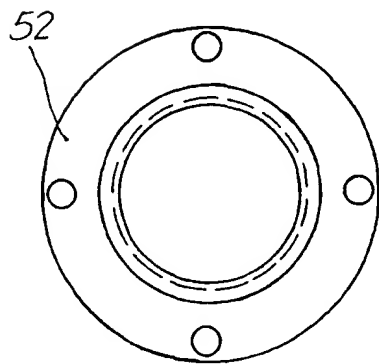


FIG. 6



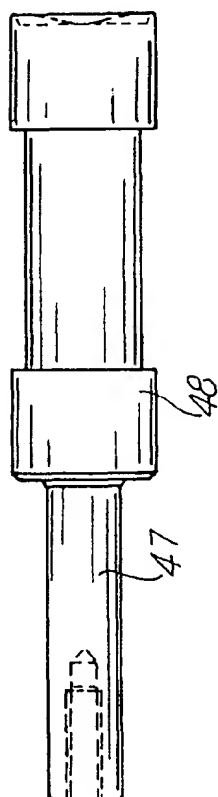
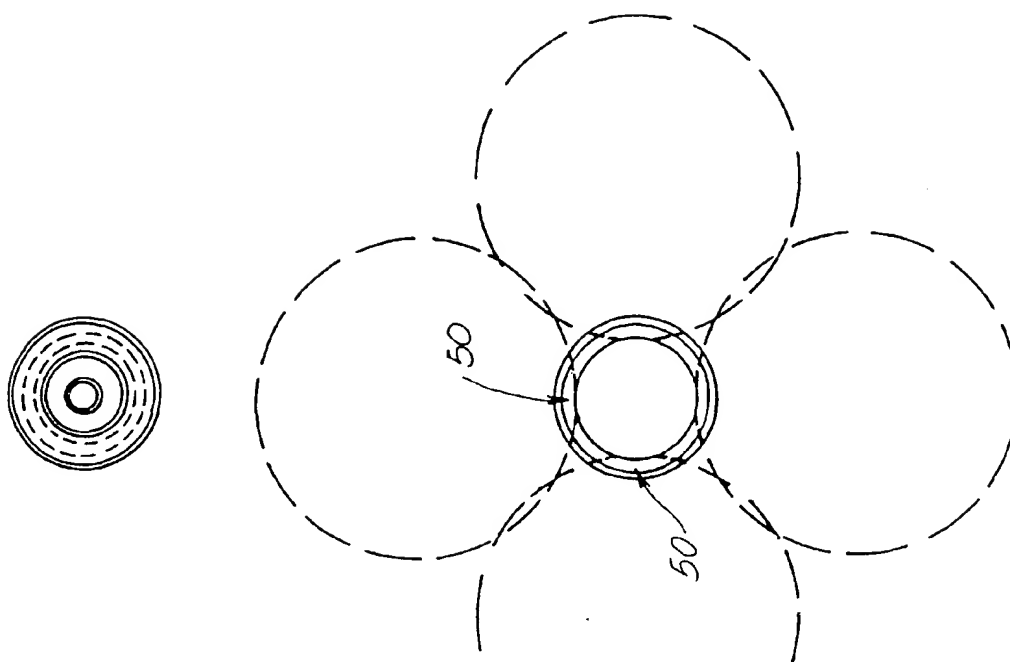


FIG. 7

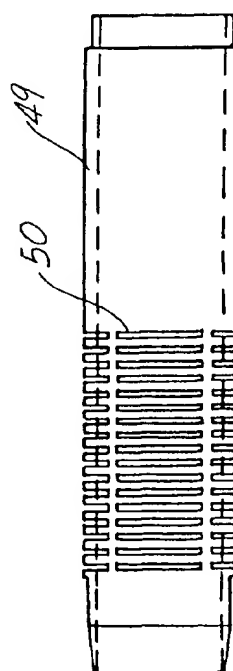


FIG. 8

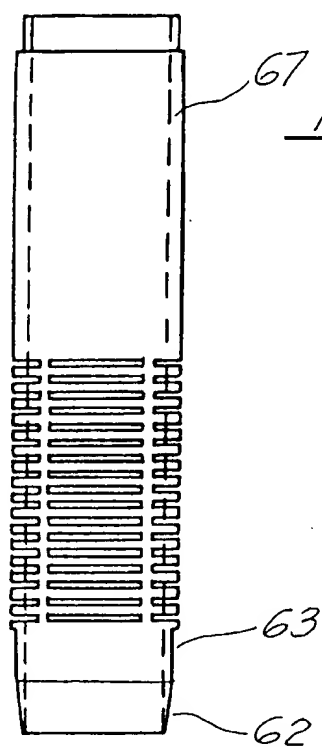
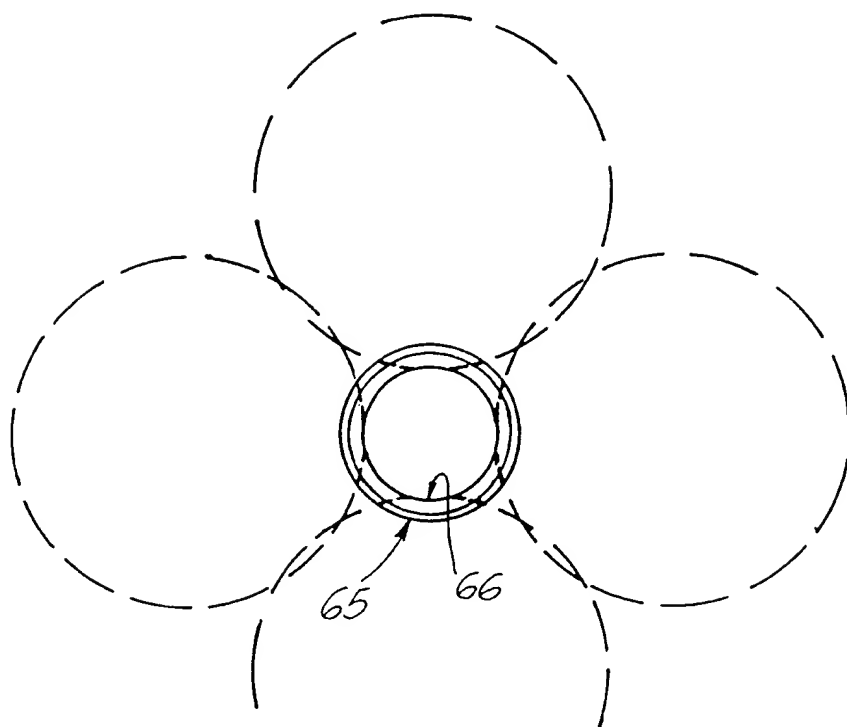


FIG. 9

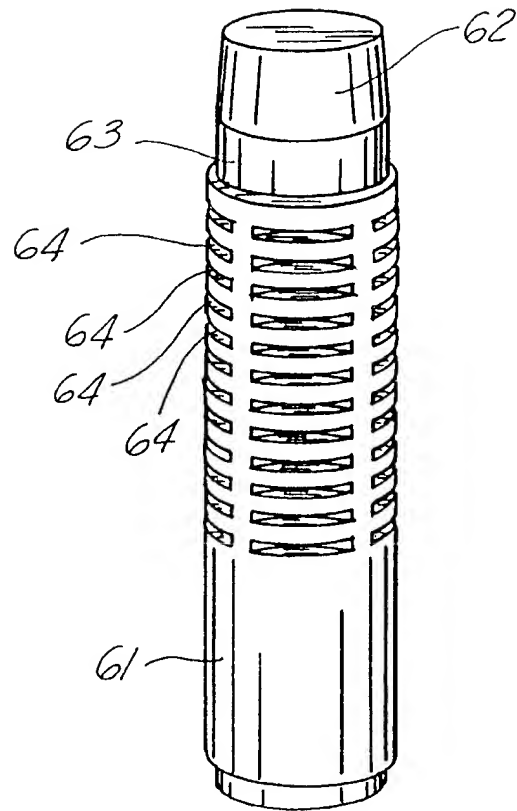


FIG. 10



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 11 2545

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US-A-4 700 620 (CROSS) * column 1, line 63 - column 5, line 8; figures 1-9 *	1-5	A23N1/00
A	EP-A-0 442 535 (FMC CORPORATION) * column 2, line 55 - column 6, line 14; figures 1-4 *	1-5	
A	US-A-3 236 175 (BELK) * the whole document *	1-5	
A	GB-A-2 116 021 (SCUDDER) * page 2, line 1 - page 3, line 96; figures 1-5 *	1-5	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A23N
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 4 November 1996	Examiner Herygers, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>I : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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